Preserve

App F IX 4

1933-34

File No 142-33

Previous References (nil)

Serial Nos 4

Later References

GENERAL AND REVENUE SECRETARIAT

Serial Nos)

Part B for August 1933

SUBJECT

Note by the Health Officer, on the quality of Drinking water in the Bangalore City

CITY MUNICIPAL OFFICE
BANGALORE

Dated 27th October 192

GEN 195 11 27 OCT
L. & L. BRANCH

My dear Mr Ranga Rao,

I enclose for the information of Government a copy of the letter sent to me by the Health Officer in connection with the quality of drinking water in the City

I Though it is not so
Otherwise State, it would look
as if the Water is not Satisfactory — This will help to
the D of H for further arrangements
to be made -

I am,
Yours sincerely,

R Ranga Rao, Esq, B A, B L,
General Secretary to the Government of Mysore,
Bangalore

27 OCT 1927
No. 3394

Since about the beginning of August, as we are getting more frequently in the Typhoid infected localities we are sending to Public Health Institute also samples for chemical examination are sent I had a talk with the Superintendent of Public Health Institute about examining the water chemically he has agreed to examine the water once a fortnight

I enclose herewith a copy of the letter, I have written to him to-day

K. Subba Rao
Health Officer,
Bangalore City

K S Rao

OFFICE OF THE HEALTH OFFICER,
BANGALORE CITY,
DATED, 27th October 1932

Sir,

In continuation of my personal talk with you yesterday about the Chemical examination of water, I write this letter to confirm that you were agreeable to do the chemical examination of water once a fortnight including the Residual alum and chlorine tests

Further, may I request you to kindly let me know whether I can send 3 samples of water from each of the nine Divisions of the City, twice a week?

Yours Sincerely,

Health Officer,
Bangalore City

Typed 27 10 32

To

The Superintendent,
Public Health Institute,
Bangalore

A. S. Rao.

Serial No

Lr No NO-68-932 dt 29-10-32

3 Forwarded with Compliments and Thanks to the Director of Health for favour remarks & Proposals if any.

By order,
- Subbarao
For General Secretary to Govt

OFFICE OF THE DIRECTOR OF PUBLIC HEALTH MYSORE
Rly 5/11/32
C 533
File No
Despatch No

C533-2
4 5-11-32

Bacteriological analyses show the filter effluent is not uniformly satisfactory. There are occasions when it is worse than the water applied to filters —Waters from the distribution-taps give results ranging from good to very bad Latest results of analysis of certain tap waters from Basavangudi have given very poor results indeed

GENERAL SECRETARY 7 JUN 1933 No L 5 1756

5 One infers from these that the mixed raw water from Hesarghatta and Yelemallappanakere does not receive proper treatment in the filter station and that in some parts of the distribution there occurs some contamination.

The treatment given to the raw water to purify it consists at present of

1) Sedimentation in the settling tank after addition of alum

2) Addition of chlorine to the settled water

3) Filtration in gravity Jewell Filters

There are two settling tanks, of which only one is in service at present the other being under conversion into a storage tank for pure water from Thippagondanhalli. Settlement is for about 6 hours There were of course, better chances for longer

settlement when both tanks were working One being thrown out perhaps affects the quality of water The arrangement for mixing of alum to the raw water can not be said to be satisfactory either The present arrangement does not tend to the much desired intimate mixture

Chlorine is added to the settled water in its course to the filters The present chlorinator - Jewell Pardon - is not working satisfactorily The dosage is about 17 parts per million As the water contains a large quantity of organic matter this dosage is quite inadequate Further, with this dosage there is no residual chlorine for sustained action It very quickly gets exhausted It is understood the chlorine plant does not provide for the addition of more than 2 parts per million

The 7 filters clarify the water While they do so, they do not seem to hold back organisms which in the meantime will have multiplied owing to the inadequate chlorination

The filtered water is led on to the C & M Station pure water tank and into the City main The C & M Station authorities chlorinate their supply before distribution No such arrangement exists for the City

In the city distribution there is occasionally, deterioration in bacterial quality This may be due partly to multiplication of organisms

organisms which the filters have allowed through and partly perhaps to some contamination in the distribution pipes

The present purification plant is and will be subject to dislocation in view of its having to be adjusted to the Thippagondanahally scheme So, major alterations in the present working are out of question The following measures for improvement of water supply are however suggested which will not cost much but which at the same time will fit in with new scheme -

1 Supplying of a more efficient type of chlorinator than the one now in use The Jewell Pardon chlorinator has given unsatisfactory service from beginning and can not be relied on The purchase and installation of Wallace & Tiernan type MSV Vacuum chlorinator is necessary immediately This chlorinator would be a suitable stand-by for the treatment of water in the Thippagondanahally scheme

2 Since the C & M Station authorities have objections to chlorinate the water after filtration and before it is pumped to their pure water tank special arrangements will have to be made to chlorinate only the city main This can only be done the installation of a Booster pump which will the chlorine solution into the main

3 The question of rectifying the distribution is not easy The City Health Officer is bringi the notice of the Water Supply Division the def noticed by him And in proportion as these get attended there will occur improvement

The addition of chlorine into the City

Quality of drinking water – Bangalore city –
1932

If approved a copy of this may be sent to the Director of Health Services for information and necessary action

8/11/32

It is seen from the reference to the 2nd para of the proposal by the Engineer to send an officer to the City Engineer for further action in reference to the suggestion of the Director of Health

(sd) 8/11/32

II Member

6 IT Member 7/11

7 Yes

14/11

17/11

GENERAL SECRETARIAT
8 NOV 1932
No.

9 NOV 1932
No 2851

Forwarded with compliments unofficially to the Chief Engineer in Mysore for favour of taking further action

By

Asstt. Secretary
For General Secretary

No 8079-31
Dt 21-11-32

No 2456

22 11 32

GENERAL SECRETARIAT
16 NOV 32

10/11/33

CO 245
9/1/33

Returned with compliments

The Director of Public Health has furnished the
latest results of the following

Serial No

causes The points referred to in the note of the Director of Public Health have been fully answered by the Executive Engineer Mr H F Marker in his note No 487 dated 14th December 1932 which accompanies I shall only summarise them briefly -

1 One of the two settling tanks has been thrown out of action He says that the settlement is for about 6 hours now and that this partly accounts for the bad results As has been pointed out by Mr Marker, even when two tanks were functioning there have been occasions when the analysis did not show uniform results After one tank has been put out of action for periodical cleaning without any untoward results

The time of settlement with one tank is not 6 hours, as stated but much more as the capacity of the tank is 3 million gallons against 3½ million drawn every day In the new Mangalore water works even 6 hours sedimentation is not allowed as 3 to 4 hours is considered sufficient In the Betrabad plant (K G F Water Supply) the time allowed for sedimentation is only 6 hours

The arrangement for the mixing of alum has been in use from the year 1909 and it cannot be said that this has suddenly become unsatisfactory

2 The next cause is said to be the inadequate dosage of chlorine based on the exter-

WD 762—GPB -1 000—17 10 30

Quality of drinking water – Bacteriological

2 1956

If approved a copy of this may be sent to the Director of Health Services for information and taking necessary action

8/11/32

5 Submitted for orders with reference to the 2nd sentence in para 2 above. The file may after perusal by the Minister be sent back to this office to the Chief Engineer for further action with reference to the suggestion of the Director of Health Services

(Sd) 8/11/32

11 Minister

6 I agree 8/11

7 Yes

14/11 17/11

8/ Forwarded with compliments unofficially to the Chief Engineer in response to for favour of taking further action

B.

Asuboda Rao

For General Secretary

8/

GENERAL SECRETARY
8 NOV 1932
No

9 NOV 1932
No 2891

No 8079-31
Dt 21-11-32

No 245
22 11 32

GENERAL SECRETARY
16 NOV 32
No

No 245
9/1/33

Returned with compliments.

9 The Director of Public Health has attributed the satisfactory results of latest analysis to the following

Serial No

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2 The next cause is said to be the inadequate dosage of chlorine ... on the extent

WD 762—GPB -1 000—17 10 30

chlorination now done at the filters was once objected to by the Civil and Military Station authorities and it is only by an informal understanding that they have -- agreed to the small dosage of chlorine The dose cannot be increased on this account The Jewell Paradon type chlorination is not bad as such but a higher pressure of water is necessary to work the injector than we can -- possibly give This will be improved when the new supply starts

I cannot therefore agree with the Director of Public Health that the raw water from Hessarghatta and Yelemallappa Chetty tanks does not receive proper treatment at the Filtering Station If it did not, and there was contamination at the source, the whole city would have been affected and not merely isolated localities About a year ago an American from Chicago saw me and expressed how he wished that they had as good water at Chicago as Bangalore has

I quite admit that sources of contamination do exist in the distribution system in certain localities as clearly pointed out by Mr Barker The Municipality will have to take necessary action to improve the sanitary arrangements and provide sufficient funds for improving the distribution system As an immediate step the distribution ~~lines~~ mains in such isolated localities as where cases of typhoid have occurred may be taken up for cleaning or for relaying as may be necessary The Executive Engineer will be asked to take necessary action in consultation with

55

Public Works Secretariat | File No | of 193

Serial No

- 4 -

the Municipal authorities

Gen. Secretary / Chief Engineer of Lyppe
7/1/33

TSRM

1) Submitted with reference to para 7 supra

GENERAL SECRETARIAT 12 JAN 1933 No

8 CE 11/1/33 Genl Secy) 11 JAN 12/1/33

12) Please put up the detailed report sent by the Health Officer

PS 19/1/33 MSR 20/1/33

The Sanitary section of the Secretariat may be requested to put up the report as directed at para 12

To Mr Brohier, with compliments

8 20/1/33 CE 20/1/33

Action after the report is put up

PS 23/1/33 A'-S Gj)

Submitted

GENERAL SECRETARIAT 24 JAN 1933 No

8 CE 23/1/33 Genl Secy) MSR 25/1/33

As I believe the Thittapagondana-Kotte Water Works will begin to function in about a month, it is perhaps not

Note Contn sheet

WD 762—GPB -1 000—17 10 30

necessary to go into this question I should say, however, that as many of the P-U D as such, should be guided on Health matters by the Health authorities

A detailed report should by the Health Officer exactly shows how defective the distribution system is. It serves no purpose whatever if the water in the reservoir is pure if this pure water at the drawing end is impure at the drawing end it is what should be ensured

Play

The matter is, I believe, before the P W D as well as the municipality and may be hoped that the position will be improved.

I am informed the distribution system

RZ
24/1/33

P W D Memo

On 27th
S dM b rC 1
26 JAN 1933
No 5962

Copies of markers & in Rangoon note may be sent to the municipality hereby be requested to discuss the points with me at an early date

Please floy and add contn sheet to the sanction of GC

for MPB

hy
28/1/33
28/1/33

Draft issued
CB
31/1

Issue
31/1/33

1956

General and Revenue Secretariat | File No | of 193 | [App I III—2

Serial No

To the ML Commr Bldg
Do No L5700 Dt 2.2.33
Forwards Copies of Notes by the Executive Engineer & the Chief Engineer about the quality of drinking water in the city and requests to discuss the matter personally with the second member of Council at an early date
Said Dt approved the file will be submitted to the second member of Council

Please keep it Secy B till 20th May be sent when called for as the detaining is not felt

MBK
4/2/33

Secy B
Filed Dt 2.2.33
21/2

Dft to the ML Commr called as directed by the Asst Secy
RMM 23/5

ISSUE SECTION
25 MAY 1933
GNL & REV SECT
Issued No 7779 Dt 27/5/33

No reply has yet been received from the Municipal Commissioner for orders if the file may be closed
RMM 10/7

Thus may perhaps be done, as the Thippagondanahalli reservoir has come into service & as orders have been issued re the improvement of the distribution system in the City

Chief Secy
MS 26/7

20 JUL 33

Note—Contn Sheet

WD 0246 —GPB—15 000—22-8-32

11-2 V 553

File No | of 193 | General and Revenue Secretariat

Letter Nr 4/T 30 dated 26-4-1933 from the Municipal Commissioner Bangalore city stating that he discussed the matter personally with the Second Member of Council and that action is being taken to investigate into the ~~Channels~~ of contamination of the water by the mains being laid in defective conservancy lanes and to remedy ~~the defects~~ such contamination

The Municipal Commissioner reports that the Range officer, Chamarajendra Water Works has been requested to take up the work of ~~preventing~~ the contamination the cost being in due course met by the Municipality It is also reported that the mains near Basavangudi Balancing tank ~~at~~ were examined and were found to be free from contamination thus further action taken on the matter would be reported

Submitted for perusal

8/8 (Chief Secy) 10/8

18/8 18/8

✓ 6/8

OFFICE OF THE HEALTH OFFICER
BANGALORE CITY,
DATED, 15th NOVEMBER 1952

MEMO

SUBMITTED TO THE COMMISSIONER -

Basavangudy is an Extension of Bangalore City to the south and was begun on 1898-99 soon after Plague broke out in Bangalore The Extension is in the form of a rectangle with the boundary roads running North, South, East, & West The Roads within the Extension run parallel to the main roads except 4 diagnal roads on one of which shops are located Three more additions to this Extension were made Shankarpur and Gavipur towards the west and Visweswarapur to the north There are in all in Basavangudy alone 1862 sites of which 1277 have been built as per Census of 1951 with a population of 12,191 The houses in the Extension consists of big Bungalows with extensive compounds, medium sized Cottages with a small compour and small houses which are either tenemental houses or single family houses In addition there are over 300 sheds built in the midst of Bungalows either in unbuilt Bungalow sites or in the compounds of Bungalows These sheds are the living quarters of people most of whom work as coolies The people that live in the sheds have no latrines of their own and utilise every open space protected with vegetation or Conservancy lane as latrines As there is no drain for these sheds, the place round about is made into a slushy area with sewage and sullage of the house

The houses of the tenemental Type are situated in the 7th Block, 6th Block, very close to the residential quarters and behind Gandhi Bazaar Road

ROADS - There are 16 main roads and 60 sub-roads with total length of 25 Miles of roads of which 16 miles are metaled and 9 miles gravelled

CONSERVANCY LANES - There are 118 Conservancy Lanes betwee rows of houses Of these 17 have no drains on both sides, 24 have no drains on one side and in 15 lanes, the drains are

badly damaged ie out of 118 conservancy lanes, 56 or nearly 50 % require drains badly Taking the total number of roads and their length nearly 76 roads and 25 miles in Basavangudy, the total length of open sewage drains in Conservancy Lanes which are 118 in number that have to be provided on both sides, may be taken as nearly 50 miles But the total length of drains provided so far is 13 miles and 171 Furlongs as per Hand-book There are in addition 18 miles of storm water drains, many of which carry sewage and waste water from the houses as connections are made from the front of the houses in addition to the connections to the Conservancy Lanes There are 3 Miles, 6 Furlongs and 140 yards of under ground drains with intercepting gully traps at the end of Conservancy Lanes

As a result ~~of~~ want of drains or presence of drains in bad repairs, defective water connections, from houses, and the washings from latrines getting on to the Conservancy Lanes, the surface soil is allowed to be soaked with sewage, certain places as shown in the plan are so soaked with sewage that the place is a slushy paddle, earth perhaps to a depth of ~~&&&&&~~ at least 5 or 6 feet

PUBLIC LATRINES - There are no public latrines or urinals for the use of the public in any part of Basavangudy or in any of the other three Extensions which together cover an area of 964 acres

LATRINES OF HOUSES - Of the 1,300 houses in the Extensions 18 have no latrines The rest are of the trap-door and chamber type with small baskets as receptacles for night-soil The design is such that urine and waste water flow into the basket and wash the night soil of the basket on to either the drain or to the conservancy lane where there are no drains or where the drains are defective or in bad repairs ~~345~~ 407 latrines and 515 drain connections are in bad repairs In addition, the people that live in 300 sheds do not have private latrines The use the unbuilt sites and Conservancy lanes as latrines

CONSERVANCY & SCAVENGING - There are 12 sweepers to sweep the 70 roads and 118 Conservancy Lanes which together are bou

are about 50 Miles in length There are 12 drain cleaners and 2 Man-hole cleaners to clean 32 Miles of open drains and 3½ Miles of under-ground drains There are 12 Scavengers to remove the night soil from private latrines with an average of nearly 120 latrines per scavenger, with the distan a scavenger has to cover in a widely spread out Extension lik Basavangudy, it will be hardly possible for a scavenger to attend to more than 40 latrines a day. Considering the design of the latrines, the condition of their floor and the basket used , the work turned out by the 12 Scavengers cannot be expected to be satisfactory if one has to attend to 120 house a day. The number of Scavengers may have to be trebled to g a satisfactory service But the number must be doubled immediately.

REMOVAL of night soil - The Scavenger collects night soil in big basket and leaves it in the Conservancy Lanes for an hour or so bef the contractor can carry it in the manure carts The Contractor leaves the night soil smeared baskets in the Conservancy lanes after transferring the material into his cart Even if buckets are used inplace of big baskets for collectio and storage, there is no provision at present for washing the soiled buckets after the material is transferred to carts

WATER SUPPLY - As the Extension cannot get its supply directly from the Jewel Filters, water is pumped up from the mains and stored in Balancing tanks for suppying the several Sections of the Extension The water mains are taken from the Balancing-tanks through main roads, but the sub-mains and the smaller sub-mains, pass through Conservancy Lanes, the condition of which is already described above In many of the places, the soil is so moist that the soil may be soaked in sewage to a depth of about 5 to 6 feet

Considering the age of the pipes laid nearly 30 years back, the unavoidable joints and the intermittent supply of water that is in vogue, it is most probable that some of the sewage is sucked into the pipes at times when the earth is very wet Further, there are 30 bad water connections to

the

to the houses, passing through the drains into the houses providing an easy chance for pollution

As water cannot be obtained easily, in many houses hand pumps are provided to pump water from the mains The pumps are fixed in earthen pits bathed in muddy water This water is perhaps the water that leaked out of the pumps and this water is partly pumped again into the pipes as the gland cock is immenssed in the muddy water In two of the infected houses i e Mr K Subba Rao and Mr Gundu Rao, where there were 3 & 6 cases respectively, pumps are provided in the way above described

Further in some houses as in Mr Srinivasa Murthy's house VII Block, an opencement cistern is constructed in the open yard below the ground level and a tap provided in the cistern The Tap is kept open so that water may be collected whenever it can be collected This arrangement is also a possible source of danger In the gentleman's house there were two cases of Typhoid this year in September

Thirty two samples of water were sent for Bacteriological examination -

Results are as follows -

Lactose Fermenters in	1 c c	of water found in	9 sample
-do-	5 c c	-do-	9 "
-do-	10 Cc	-do-	6 "
-do-	20 c c	-do-	3 "
-do-	30 c c	-do-	1
-do-	40 c	-do-	--
Lactose Fermenters not found in	50 c c		4
		Total -	32

A sample of water is considered to be good when no Lacto Fermenters are found in 50 C C. Out of the 32 samples only four were found to be good.

Samples of water from other parts of the Extension are being sent for similar tests to find out whether the sewage contamination is limited to any of the Section or Sections

HOTELS - There are 2 Hotels and 5 Coffee Hotels

COW-SHEDS - There are 41 cow-sheds in all They are distributed as follows -

as follows - years

VII Block	10
100 feet Road	17
Gandi Bazaar Road	3
III Road	1
Ramamandiram Road	4
East Road	2
Lalbagh Road	2
North Road	2

INCIDENCE OF INTESTINAL DISEASES OR FILTH DISEASES - A statement of the total number of admissions to the Basavangudy Dispensary for intestinal Diseases Diarrhoea, Dysentery & Enteric for eight years uptodate from 1925 classified according to month is appended -

The Doctor in-charge of the Dispensary says that the cases noted under Enteric in the Statistics is not the actual number treated in Basavangudy, but the number who attended the Dispensary The actual number treated both in the Dispensary and outside, as per his statement will be very much more

The following numbers have been treated during the 8 years: 1245, 1136, 1208, 1997, 1394, 1748, 2879, 280, for Diarrhoea and Dysentery put together Taking for granted that 25 % of the people that attended the Dispensary are from Visweswarapur, and Shankarpur - 1311 and 2160 people have suffered during 1930 and 1931 out of a population of 12,191 or 10 7 % and 18 % of the total population during the course of the year From the statement it is found that there is a definite increase from year to year upto to 1931 and in 1932 there is a drop

When classified according to months, generally there is an increase during summer months and during rainny months

As regards Typhoid, there is an indication that there has been an increase from year to year since 1926 till 1930 when the largest number (i e) 410 were recorded, in 1931 the recorded cases have dropped As regards the diagnosis of Typhoid it is likely that many cases are recorded as Pyrexia during the first four or five days when the patient attended the Dispensary and when they stopped attending as the patient could not attend, the actual number of cases that could be diagnised as Typhoid cases might have been continued as Pyrexia and could not be recorded as Typhoid

It is probable that mass immunity has increased during the years 1930 & 1931 leading to a drop in the incidence of the diseases

During the year 1932, the Typhoid admissions in the Dispensary are as follows -

January	4
February	1
March	-
April	-
May	-
June	-
July	-
August	1
September	6
October	3

But the total number of cases traced by the Health Department by getting at the Practitioners practicing in Basavangudy as far as possible and the Dispensary is as follows -

	BASAVANGUDY -	VISVESWARAPUR -	SANKARPUR -
January	4	-	-
February	1	-	-
March	-	-	-
April	-	-	-
May	-	-	-
June	-	-	-
July	2	2	1
August	2	-	-
September	33	4	5
October	15	3	1
November	1	-	-
TOTAL	~~46~~ 58	9	7

The incidence of Typhoid during the yeat 1932 and its distribution during several months of the year indicates that the infection started in July and increased during the months of September and October i e started with early rains but increased during later rains

Rains increase the wet condition of the surface soil and also raise the subsoil water level, thus giving greater chances for the leaky pipes, if any, to uck up the moisture during the intermitant supply of water

Of the 58 recorded cases, 5 cases were recorded during January and February of 1932 During the present epidemic total number recorded in Basavangudy is 53 Taking the unreported cases as equal to the reported, the total number of cases during the epidemic may be taken as 106

The reported cases are distributed in the Extension as follows -

Basavangudy 5th Cross Road	6
-do- 4th -do-	4
-do- 3rd -do-	10
-do- 100 feet Road	4
-do- 7 th Block	9
-do- 8th Block	3
-do- Kankanhally Road	4
-do- Mohamudan Block	1
-do- II Cross Road	1
-do- 6th Block	1
-do- Rathnavilas Road	1
-do Nagasandra Road	2
-do- Poor house Block	1
Krishnarajendra Road	1
Gavipur Extension	5
Total -	53

Age distribution is as follows -

Under - 1 Year	2
1 to 5 Years	7
5 to 10 "	18
10 to 15 "	9
*15 to 20 "	8
20 to 30 "	-
30 to 35 "	1
35 to 40 "	2
40 to 45 "	1
45 to 50 "	2
20 to 25 "	3
Total -	53

MILK SUPPLY -i One Abbay Naidu supplied two of the infected houses and other houses as well No cases have occurred in any other house than these two Further infection took place in the two houses with an interval of over one month

ii Erappa supplied milk in two houses, here too there is an interval of over one month between the two infectio He does not supply any other house

iii Machamma supplied two infected houses The interval in this case is one month and 10 days She too does not supply anybody else

Arrangements are being made to get the motrons of thre thr persons examined for Typhoid

The other houses get their supply separately or have their own milk supply

The information received from all the infected hous is that, they boil milk and use it

FLY.- As regards Fly - there is material enough for providing facilities for breeding of flies, but the occurrence of the disease during the cold months of the year when the Fly population is at its lowest, goes against the possibility that the Fly is solely responsible for the present epidemic It is possible that it is partly responsible in those instances where there have been reported more than one case in the same house

HOTELS - Hotels with carrier cooks and servers, No definite history of one particular Hotel or Hotels have been traced to be responsible for the cases

The widespread epidemic of the disease all over Basavangudy though some parts as III Cross Road are more affected than the rest is an indication of a waterborne epidemic than any other. Further the existing sanitary conditions as the nature of latrines, the method of collection of sewage urine and sullage from the houses, existence of open drains in bad repairs, absence of drains in many of the conservancy lanes leading to the soakage of sewage into the soil in conservancy lanes might have had a cumulative effect to produce the necessary environmental conditions for the epidemic

Further, the water main and sub-mains are carried through the sewage soaked conservancy lanes and connections are taken into the houses from the conservancy lanes through the walls facing them There are as many as 30 cases in which the water connections are taken through sewage drains

Bacteriological examination of 32 samples of water from the infected localities mentioned above indicates that the water is not bacteriologically satisfactory in 29 samples The report is herewith appended Further three samples of wat

were taken from one of the houses in VII Block where there two cases on different dates All the three samples have given bad results Investigations were made to find out the cause for the pollution of water after the connection is taken from the submains in the conservancy lane to see for any leakages in the connection line to the tap, but none were found The connection is taken deep down below the side drain into the house and the pipe is not visible until the tap indicating that the pollution may be in the course of passage of water in the submains in the Conservancy lane

Out of the 34 samplse taken only four were found to be good This is a condition in which though the water is good when it leaves the filter, is not found to be satisfactory at the place where the consumer actually uses it

MEASURES.- ALREADY TAKEN -

1. One Overseer and one Daffedar and 10 Scavengers were drafted from other Divisions and deputed for special duty in the Extension

(1) To clean the private latrines with kerosine emulsion The Staff cleaned all the 1,300 latrines in a week's time. They attended to the cleaning of Conservancy Lanes to prevent the chances for the breeding of flies in the conservancy lanes and of conveying infection They are still continuing the work

2 All the Dairies have been disinfected and particular care is taken about the latrines in the Dairies

3. All the Hotels have been disinfected

4. 3,000 hand-bills have been distributed in the Extension informing the nature of the disease how to prevent Typhoid and to prevent further infections in a house where there was a cass of Typhoid

5 Anti-Typhoid inoculations were started. Vaccine is stocked and Dispensaries are also supplied with Vaccine

6 The Staff keep in touch with the Dispensary, Hospital, and the Practitioners to get as early as possible information of fresh cases of Typhoid so that further spread in the locality may be avoided

7 The Practitioners have been particularly requested

re uested to notify the diseases and ~~and~~ notifying C ~~n~~ have been sent to them.

8 Arrangements have been made with the Public Health Institute to examine Urine, Motion, Blood, of continued fever cases for providing an early diagnosis

9 The Staff have been particularly instructed to prevent sale of stale food, Sweets, unripe fruits, etc

10 The Water works Engineer has been requested to clean up and disinfect the Balancing Tanks

11. The Executive Engineer was taken round and shown the conditions of the Conservancy Lanes through which ~~the~~ mains are taken. He gave instructions to his ~~staff~~ to find out the leakages A letter has also ~~been~~ to him in this respect to kindly rectify the ~~defects~~ there are any.

12. As the Bacteriological results were bad, Executive Engineer has been requested to chlor~~inate~~ water either in the balancing tanks or at the p~~umping~~ station which ever that it is convenient

13. A list of bad connections is sent to the Executive Engineer to disconnect the pipes so that the owners may relay the pipes sanitarily

PROPOSAL FOR THE PREVENTION OF AN EPIDEMIC OF TYPHOID IN BASAVANGUDY -

They may be considered under the following heads

1. Water Supply
2. Sanitary Conveniences-
3. Conservancy & Scavenging
4. Conservancy Lanes

I WATER SUPPLY -

(a) Arrangements may kindly be made e rly to provide a continuous water supply instead of the intermittent supply. It is stated that with the present distribution system it is not possible to get a continuous supply even though water is supplied from Thippagondanah ~~Water~~ Works ~~the~~ question of changing ~~the~~ ~~present~~ ~~distribution~~ system

system may kindly be undertaken immediately

(b) The filtered water as it comes out of the filters does not contain any residual chlorine, arrangements may kindly be m so that the filtered water when it gets into the mains may cont. residual chlorine

(c) The Executive Engineer, water Works Division, may kin be requested to immediately undertake the investigation of leakages in mains and sub-mains and rectify them

(d) Bad water connections to the houses -

The list of bad connections were sent to the Executive Engineer for cutting of connection so that the owners of houses may be compelled to relay the pipe The Executive Engineer has written that he cannot take action and that he would take actio if the Municipality gave him the authority Notices are being issued to the parties to relay the pipes from the Office

5. The water mains and submains that are taken through the conservancy lanes may be shifted and relayed in the main roads This procedure will involve an immense Municipal expenditure an the house owners will have to take fresh connections from the road mains This proposal is very costly, troublesome and not so easily workable

SANITARY CONVENIENCES - Steps to be taken may be divided int two groups

1 Steps to be taken by the owners of houses
2 Steps to be taken by the Municipality

Among the latrines in 1,300 houses, 407 are in bad repairs 17 houses have no latrines In 515 house the drain connections are not proper, allowing the sewage water on to the surface of the Conservancy Lanes instead of into the Municipal drains Notices have been issued to all the owners for repairing and constructing the latrines and construc ing the drain connections

Those who have to construct new latrines and those tha have latrines in a very bad condition will be requested to adop a new design instead of the trap door latrines Each house will be particularly requested to use galvanised instead of baskets which cannot be cle ned do not t in ole urtior

As a very large percentage of the population in Basavangudy is educated, it is hoped that the measures will be adopted without any difficulty As regards the insanitary sheds in existance, notices were issued to all and further procedure will be taken as none of the sheds are demolished.

2 Provision of Public Latrines and Urinals -

There is a provision of Rs 5,000/- in the current year's budget for latrines and urinals A bore-hole latrine of eight(8) seats is provided near Bull Temple Road. Similarly public Latrines and Urinals will have to be provided near the East Road Mohamudan Block, Bugle Rock and near the Jutka Stand. The latrines and urinals will have to be converted into Flush ones wherever it is possible.

III CONSERVANCY & SCAVENGING.-

(a) At present there are 118 conservancy lanes, in addition to the roads that have to be cleaned and looked after The area of Basavangudy is so very extensive and the houses are distributed so far apart that it is not possible for the present number of Sweepers and Scavengers to attend to the sweeping and scavenging regularly on account of the small number of men engaged The number of Scavengers and Sweepers have to be atleas doubled immediately to get better and daily service (i.e) 24 Sweepers, 24 Drain-cleaners, 24 Scavengers, and 4 man-hole cleaners.

In addition, the number of nightsoil soaked baskets used by the Scavengers are left in the Conservancy lanes for use for the subsequent days leaving them exposed for the flies. Buckets can be used by the Scavengers instead of Baskets, but places with water supply will have to be provided close to the man-holes for the Scavengers to wash the buckets and keep them clean after use every da until the underground drain is provided

(b) The present method of carrying of nightsoil by Contra is not conducive to good sanitary conditions, as the cartmen ve often leave baskets full of night soil in the conservancy l ne because they do not want so much or their c rts do not take in or they do not require as much as is available Further there usually an interval of one to two hours between the time whe

carman removes it

The only alternative if the underground drain as suggested below is not undertaken immediately, is departmental removal and the preparation of campost The Municipal Commissioner has already requested Mr J J Mieldazis for a detailed estimate for the preparation of compost, and the other details for the Departmental removal of nightsoil have already been worked out

(c) Drains - One of the two measures have to be adopted

(i) To repair all the drains in a bad condition and to construct new drains where there are no drains

A plan showing the places where drainsare wanted is herewith submitted

(ii) To have a complete system of underground drains for the whole of Basavangudy Extension

The first proposal will involve an expenditure which will go to waste when the proposed underground drainage scheme is taken up for execution The expenditure involved will not be a small one as nearly 50 percent of the conservancy lanes have to be provided Further one half of Basavangudy (i.e) if a diagnal line is drawn between the south/west corner and north-east corner, all the portions to the west of the line are provid d with underground drains partially, the main of which drains into the main sewer that joins the Kempambhudi septic tank

An estimate is being prepared for a main sewer from the southern end of East road over the New Mavally Road to the main-drain It is well worth spending money to extend underground drains all over Basavangudy instead of spending on the constructions of open drains

In connection with underground drains the question of carrying the sewage and disposal from the sewered area to the disposal site should be taken up simultaneously

From the plan of the underground drains kindly sent by the Executive Engineer, Sanitary Division, it is found that whole of Viswesvarapuram and Sankey Tank are sewered

Sankarpur Main joins the main sewer that is taken to the Kempambhudi Septic Tank The 12 Inch main sewer of Visweswarapur joins the main open drain near Kumbargundy Road

An 18 inches main starts from the main-drain about two furlongs from the point of entry of 12 inches main and ends in the septic tank of Sunkal Farm If calculations permit, the 12 inches main of visweswarapuram may be kindly connected to the 18 inches main so that steps may be taken to request the house owners in Visweswarapuram and Sankarpuram to convert the latrines into flush out latrines and connect them to the underground drain as new water supply will also be available soon Further the main sewer of Basavangudy may also be connected to a main or aqueduct as the open main-drain cannot be made use of for taking in the night soil containing sewage

That is that portion of comprehensive scheme that deals with Basavangudy alone will have tobe taken up immediately, as Visweswarapur and Sankarpur are already fully sewered

CONSERVANCY LANES - There are 118 conservancy lanes Many of them are used by the Public as latrines Some of them are not of much use as there are only two or three big Bungalows on either side For the sake of the two or three connections, Municipality will have to spend money in constructing drains, and maintaining Staff to keep the conservancy lanes clean The question of doing away with such conservancy lanes as may be decided on their merits and disposing the land to the adjoining house onwers may also be considered as this will not only bring in money but minimise the expenditure towards drains and maintenance and avoid being utilised as public latrines and dumping grounds

The incidence of the diseases, Diarrhoea, Dysentery, and Typhoid (filth diseases) has been very high 10 to 18 % of the total population of the Extension continuously for some years If measures like the construction of open drains are undertaken , it is likely conditions may improve partially, but, the improvement will not be marked and permanent If the two measures suggested above, namely ~~[illegible]~~ [illegible]

continous water supply and completion of the partially provided underground drains is taken up immediately, the health conditions will be permanently markedly improved and maintained as the extension is fairly free from other diseases.

Health Officer,
Bangalore City

K S.Rao

F No 487/Hlc
14/12/32

UO 245
14/12/32

Submitted -

From 20 samples tested in last six months by Civil and Military Station, it is found that four were not upto the mark, 6 were good and ten were excellent From the similar number of samples tested by our Health Department, it is learnt that four were not upto the mark and sixteen were good Out of these (4 plus 4) 8 bad samples nearly four samples were bad because water was not chlorinated during these days owing to some repairs to the apparatus I feel the above tests do not show that the water is after all so bad and that too very often It is very difficult to say why sometimes the test shows bad results, it may be due to local contamination or contamination in sample bottles The Health Officer in his memo to the Municipal Commissioner, says "At present there is no definite proof that Bangalore water has been bad" This itself shows that there is nothing radically wrong with the quality of water supplied at the filters

As for the remarks of the Director of Public Health, that as at present only one sedimentation tank is in use (other being roofed), it may have something to do with the poor - result But it is not so actually Even when two tanks were in use we used to get on occasions poor results and even when both the tanks were in use water was drawn simultaneously from both the tanks for most of the time giving a settlement of 4 to 6 hours only Now too as per Director of Public Health's own statement there is a settlement of about six hours From this it follows that the use of only one settling tank cannot be said to be the cause of poor analysis which we get on some occasions

As for the present chlorination plant no doubt it is not satisfactory and was giving us trouble now and then and also a larger dosage than 7 to 8 lbs cannot be given for want of sufficient head to inject the chlorine into the main But inspite of this defect the results so far obtained cannot be said to be bad - out of 40 samples tested in six months only 4 were found to be poor As soon as the new water from Thippagondanhalli comes, this plant is going to be shifted to a new place its orifice is to be increased so as to get larger dosage of chlorine upto 50 lbs per day and a Luoster Pump is also to be installed for injecting chlorine with sufficient pressure I expect to finish this work by the end of February The firms Agent who was here has examined this plant and has promised to put the plant right if not they will replace by a new one The question of going in for a new plant of Wallace & Tiernan type as suggested by the Director, will be considered after the present plant is definitely declared to be unfit

As for the Director's statement that we have to chlorinate only the city supply and not Civil & Military Station supply as the latter are chlorinating the filtered water at their reservoir, I would like to point out that according to the agreement with Civil & Military Station Authorities we have to supply water of some standard purity and that standard is also defined in the agreement I am afraid if we do not chlorinate the water to be supplied to Civil & Military Station we will not be able to give that purity We have therefore fixed the housing of this chlorination plant in such a way as to chlorinate both the supplies to City and Civil & Military Station

As for the contamination in the Distribution System the Health Department is silent about the most important factor contributing this contamination if there be any It is the

most

most unsatisfactory and insanitary state of drainage, latrines and Conservancy lanes On my insnection of the city, I have noticed pools of sewage stagnating in many places - many lanes and streets are without any drains and if there are any many of these are in state of bad repairs Latrines of crude kind are still existing and filth from them leak into the adjoining soil Practically the whole soil of Bangalore in inhabited and congested localities is sewage sodden It is therefore very likely that when pipes are laid in such a soil and being buried for last 20 years some of them might have been deteriorated forming tiny holes which may allow contamination through them This is mostly the case with house connections It is very difficult to find out such pipes without keeping open all such lengths and examining them This is impracticable in actual practice I am afraid until the general sanitation - drainage and latrines are improved, there will always remain that danger of contamination to the Distribution System We have first to remove the cause than remedy the defects This condition of drainage and latrine is really at the root of the prevalence of typhoid and malaria in the city

The so called defects pointed out by the Health Officer, are nothing but mostly house connections passing adjoining the latrines and some lines laid in Conservancy Lanes where for want of drains lot of sewage is stagnating and soaking in the ground (but no pipes or joints are seen to be actually immersed in sewage) The remedy for this is better drainage and better latrines and efficient conservancy It is difficult for me to describe the state of insanitary conditions which I have noticed in some of the localities

11 12 32

Appendix F G—1]

SUBJECT

Section 9 2

File No

Serial No

Diary No of letter replied to Do No C 5-100/Encr Two

To

Dear Sir,

General and Revenue Secretariat

( )

the *193*

Date of issue 2/2/33

Signed by Mr M S K J

with reference to your Do. Ltr no 233 Dt 27 10/32 re the quality of drinking water in the city, I am ~~directed~~ desired to forward herewith copies of note no 748 Dt 14 12/32 by Mr H F Parker, Executive Engr and no 245-Dt 9 1/33 by the Chief Engineer on the subject and to request you to ~~make the Commissioner to discuss the points with the Secretary~~ this ends the matter personally with the 2nd Member of Council, at an early date.

Yours faithfully

MSK

31/1/33

List of enclosures

Copied by 31/1/33

To

The Secretary

Bangalore City Municipal

Examined by

No 2 GENERAL AND REVENUE SECRETARIAT

Dated Bangalore 31st January 1933
2nd Feb

Dear Sir,

With reference to your D O letter No 233 dated 27th October 1932, re the quality of drinking water in the City, I am desired to forward herewith copies of Note No F 487 dated 14th December 1932, by Mr H F Parker, Executive Engineer and No 245 dated 9th January 1933 by the Chief Engineer on the subject and to request you to discuss the matter personally with the Second Member of Council, at an early date

Yours sincerely,

M S K

To
P H Krishna Rao, Esq B A,
Municipal Commissioner, Bangalore City

K M R 2/31-1-33

No 7487 14th

~~U.O.245~~ dated ~~19th~~ December 1932, from the Executive Engineer, Sanitary and Town Planning Division, Bangalore.

From 20 samples tested in last six months by Civil and Military Station, it is found that four were not up-to the mark, 6 were good and ten were excellent From the similar number of samples tested by our Health Department, it is learnt that four were not up to the mark and sixteen were good Out of these (4 plus 4) 8 bad samples nearly four samples were bad because water was not chlorinated during these days owing to some repairs to the apparatus. I feel the above tests do not show that the water is after all so bad and that too/ very often It is very difficult to say why sometimes the test shows bad results, it may be due to local contamination or contamination in sample bottles The Health Officer in his memo to the Municipal Commissioner, says "At present there is no definite proof that Bangalore Water has been bad" This itself shows that there is nothing radically wrong with the quality of water supplied at the filters

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"Copy"

Extra) Dr SK

For General Secretary to Government.

mb

K M R 2/31-1-33

U O 245 dated 9th January 1933, from the Chief Engineer of Mysore, to the General Secretary to the Government of Mysore

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x x x

9 The Director of Public Health has attributed the unsatisfactory results of latest analysis to the following causes The points referred to in thenote of the Director of Public Health have been fully answered by the Executive Engineer Mr H F Parker in his note No.487/dated 14th December 1932, which accompanies I shall only summarise them briefly -

(1) One of the two settling tanks has been thrown out of action He says that the settlement is for about 6 hours now and that this partly accounts for the bad results As has been pointed out by Mr Parker, even whe two tanks were functioning there have been occasions when the analysis did not show uniform results Often one tank has been put out of action for periodical cleaning without any untoward results

The time of settlement with one tank is not 6 hours, as stated but much more as the capacity of the tank is 3 million gallons against 3½ million draw every day In the new Bangalore Water Works even 6 hours sedimentation is not allowed as 3 to 4 hours is considered sufficient In the Bethamangala plant (K G.F Water Supply) the time allowed for sedimentation is only 6 hours

The arrangement for the mixing of alum has been in use from the year 1909 and it cannot said that this

has suddenly become unsatisfactory

2 The next cause is said to be the inadequate dosage of chlorine Even the extent of chlorination now done at the filters was once objected to by the Civil and Military Station authorities and it is only by an informal understanding that they have agreed to the small ddosage of chlorine The dose cannot be increased on this account The Jewell Paradon type chlorination is not bad as such but a higher pressure of water is necessary to work the injector than we can possibly give This will be improved when the new supply starts

I cannot therefore agree with the Director of Public Health that the raw water from Hessarghatta and Yelemallappa Chetty tanks does not receive proper treatment at the Filtering Station If it did not, and there was contamination at the source, the whole city would have been affected and not merely isolated localities About a year ago an American from Chicago saw me and expressed how he wished that they had as good water at Chicago as Bangalore has

I quite admit that sources of contamination do exist in the distribution system in certain localities as clearly pointed out by Mr Marker. The Municipality will have to take necessary action to improve the sanitary arrangements and provide sufficient funds for improving the distribution system As an immediate step the distribution mains in such isolated localities, as where

hases of typhoid have occurred, may be taken up for oleaning or for relaying as may be necessary The Executive Engineer will be asked to take necessary action in consultation with the Municipal authorities.

"Copy"

Extra)

For General Secretary to Government

mb

K "I R 2/31-1-33

Mr 142-33-F

555

CITY MUNICIPAL OFFICE

No G To 30/One one

Bangalore City, Dated 25th JULY 1933

26

FROM

P H KRISHNA RAU ESQ M A,
MUNICIPAL COMMISSIONER
BANGALORE CITY

GEN & REV SECT.
29 JULY 1933
L.S.G Brn.

To

R Ranga Rao, Esq , B A , B L ,
Chief Secretary to the Govt of His Highness
the Maharaja of Mysore Bangalore

RS 28/7/33

Sir,

With reference to General Secretary's D O letter No L 5100/M1 dated 2-2-1933 regarding the quality of drinking water in the City and in continuation of my letter No 263 dated 23-11-1932 forwarding for information copy of Health Officer's Report on the investigation into causes of typhoid in the City, I have the honour to state that I discussed the matter personally with the Second Member of Council (Dewan Bahadur Rajamantrapravina Mr K Matthan), and as desired by him, I am forwarding herewith for your information a copy of letter from the Range Officer, Chamarajendra Water Works, to the Executive Engineer, Water Supply Division, describing the action that is being taken to investigate into the chances of contamination of the water supply by the mains being laid in defective conservancy lanes I have requested the Range Officer to take up the work immediately in anticipation of sanction where he finds the contamination is actually taking place, the cost being in due course met by the Municipality The President, Mr B K Garudachar agrees with me

The Mains near Basavangudi Balancing Tank, near Mr Matthan's Bungalow, and near the conservancy Lane behind Mr Abdul Wajid's house were examined and I am glad that absolutely no contamination was found in any one of them I shall keep you informed of the further action taken in the matter of investigating into this question and remedying the defects, if any

I have the honour to be,
Sir,
Your most obedient servant,

Municipal Commissioner

Forwarded with compliments

Hon President

Letter No 129 dated the 15th July 1933 from the Range Officer, Chamarajendra Water Works Bangalore to the Executive Engineer, Water Supply Division, Bangalore

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In enclosing herewith copy of letter from the Health Officer Bangalore City of No 100 dated 13-7-1933 I have the honour to state that this subject was mooted late in 1932-33 but was given up since our men were busy with works In the commencement of 1933-34, it is now possible to irvestigate into the chances or otherwise of contamination caused to our water mains by their being laid in defective conservancy lanes and by their coming to contact with drairs, etc , Hence this proposal is effected The Municipal Commissioner was pleased to tell me thi morning in the presence of the President that the remedies suggested for removal or deviation or cleaning or other protective devices for preventing such contamination will be financed by the Municipality as contribution work and wherever such defects are pointe out by them we may start the work of remedying immediately witho waiting for sanction and that their costs would in due course be sanctioned by the Municipality

I therefore request your approval to take up such works

Today as a first instance I investigated the condition in three places (1) Basavangudi Balancing Tank 4" outlet (2) Ne Mr Matthan's House (3) Near conservancy lane behind Mr Wajid's house and found absolutely no contamination in any of them The estimate for this work will be submitted duly

"Copy "

Municipal Commissioner

vvk